INFORMATION ON WATERWAYS IN THE SUDETEN REGION

(Source: Militaergeographische Beschreibung der Sudetenlaender)

German

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March 1951

II. Rivers

(See Maps 1 and 5)

Adler - Orlice

Left tributary of the Elbe (Labe); empties into the Elbe near Koeniggraetz (Hradec Kralôve). From Pottenstein (Potstejn) on, it is not fordable and is a considerable obstruction.

Headwaters:

1. (right): Wilde Adler - Divoka Orlice

a) Near Senftenberg (Zamberk) the river bed is regulated, the river bottom is 6 to 7 meters wide, and the stone embankments are 4 to 5 meters high. Between Vamberg (Vamberk) and Tinischt (Tinyste), the river is 10 to 15 meters wide. The depth is .8 to 2 meters depending on the water stage. When the river is more than 2 meters deep, the water flows over the banks.

b) Above Pottenstein

Width: 15 to 32 meters (occasionally 40 meters)

Depth: .6 to XX 1.2 meters

River Bottom: course gravel and rocky.

Banks: high and boggy; often rocky

Valley Dam: near Pastviny (BB 3957, Number 55)

Valley: above Pottenstein it is narrow and surrounded by high, steep slopes. Between Baerenwald (Neratov) and Pottenstein, it is frequently gorgelike. Valley widens out a little only near and below Senftenberg (Zamberk).

Crossings: 7 road bridges, 5 foot bridges, 3 railroad bridges.

c) Below Pottenstein

Width: 22 to 75 meters

Depth: 1 to 2 meters

River Bottom: gravelly; muddy farther on.

Banks: 3 to 5 meters high, boggy.

Valley: below Pottenstein the valley widens to .6 kilometers, and to 3-4 kilometers farther on. The elevations of the valley on the left side are always rather close to the river, are generally steep and often close to the banks,

and are higher than the elevations on the right side. The gently sloping, right side of the valley ascends to highlands which are open and easy to cross on foot.

Crossings: 8 road bridges (BB 3957, Number 52); 1 foot bridge and 1 railroad bridge.

Valley Dam and Hydroelectric Power Plant (BB 3956, Number 40) in Albrechtice.

High Water Stage: normal in the spring. Almost every year the entire valley floor is [redacted] flooded.

Ice Cover: up to 40 centimeters thick.

2. (left): Stille Adler - Ticha Orlice

a) at the source of the river near Grulich (Kraliky), the meadows are swampy; near Gabel (Jablonne), the river cuts in deeply, is 5 to 6 meters wide, and has numerous grades. River is often great in volume, but normally is not an obstruction.

b) above Chocen (similar to 1b).

c) between Chocen and Tinischt (similar to 1c).

Crossings: 3 road bridges (BB 3957, Numbers 51, 26).

3. (combined)

between Tinischt and Koeniggraetz (Hradec Kralove). Generally 40 meters or more in width. River is no longer fordable. The land on the left bank is wooded and drops steeply to the river.

Angel - Uhlava

Not to be confused with the Ohlava River which, coming from the south, empties into the Mies River near the city of Mies.

The Uhlava River is a right tributary of the Radbusa and joins with the latter above Pilsen (Plzen). Along the headward portion there are many rocky bluffs; above Neuern (Nyrsko) there is a broad meadow valley and the banks consist of pastureland. Only a short distance before the river junction is it a military obstruction.

Crossings: 16 road bridges (BB 4250, Number 118), 6 foot bridges, 3 railroad bridges.

Aupa - Upa

Is the left tributary of the Elbe River (Labe), and flows into the latter near Josefstadt (Josefov).

Obstruction: only in some places because of the valley formation, and at high water stage. Otherwide the river is fordable and is frequently spanned by bridges.

Width: 10 to 30 meters.

Depth: .2 to 2 meters.

River Bottom: rocky until Freiheit (Svoboda n. U.), then gravelly until Boehm. Skalitz (C. Skalice); farther downstream, it is sandy and muddy.

Banks: where they do not coincide with valley sides, they are 1 to 3 meters high and usually boggy.

Valley: as far as Boehm. Skalitz, it is narrow, has steep walls and is rocky in places. Above Boehm. Skalitz, there is a dam with an artificial lake (BB 3856, Number 94). East of Trautenau (Trutnov) and south of Eipel (Upica) as far as Boehm. Kamnitz (C. Kamnice), the valley is gorgelike. East of Trautenau the valley has a basin, 4 kilometers long and 1 kilometer wide.

Valley Widths: with the exception of the basin east of Trautenau, the valley is up to 400 meters in width; the valley floor is frequently covered with vegetation, but it does have paths and can be crossed on foot. Below Boehm. Skalitz, the valley floor is over 2 kilometers wide and open, and often covered with brush.

High Water Stage: usually in the spring and autumn, at which times the entire valley floor is flooded.

Crossings: 16 road bridges, 3 foot bridges, 3 railroad bridges.

Beraun - Berounka

Is the largest left tributary of the Moldau River (Vltava), and flows into the latter about 8 kilometers south of Prague. Originates east of Pilsen (Plzen) at the confluence of the Mies (Mze), Angel(Uhlava) and Radbusa Rivers. The Beraun River is a definite military obstruction. The river bottom is stony and sandy throughout its entire length. During severe winters the river does not usually freeze over until below the city of Beraun, but the river is not navigable in any case. In general, only the Radbusa River reaches the flood stage; the flooding of the banks occurs only below Pilsen and Beraun and is also unusual and insignificant.

The river has no fords, but there are numerous places suitable for crossing (see "Ferry Points"). The velocity of the river is .2 meters per second near Pilsen, usually .35 meters per second in the middle portion, and .2 meters per second near the mouth.

(Last column of table on p. 40)

Remarks

Flat banks; dry meadowland; valley is 2 kilometers wide.

Left side is steep, rocky and 100 meters high.

Right side is at first flat and stony, and is rocky farther on.

Slopes on both sides of the valley are rocky, wooded, steep.

Left side usually consists of flat, dry meadows; right side is steep and wooded.

Slopes on both sides of the valley are wooded throughout, rocky, steep.

Valley floor is narrow; slopes on both sides of the valley are wooded, rocky, steep, up to 200 meters high; banks are inaccessible in places.

Same as above.

From above Beraun, the terraced valley gradually widens out and there are short steep cliffs. Flat banks. Valley is narrow near Karlstein and the slopes here are rocky, wooded and narrow (300 meters).

Banks are flat, covered with humic, damp soil, and are 1.5 meters above water level. The valley plain is broad. Hilly.

(Footnotes of table on p. 40)

1) Figures refer to medium water stage. At low water stage, the depth is, on the average, .3 to .8 meters less.

2) All are tugboats and small boats of 1-4 ton capacity.

3) Underneath the road bridge (BB 4052, Number 3), the water is only 1-1.2 meters deep.

4) Plus 1 foot bridge in the city of Beraun.

The river is not regulated and, at present, not yet navigable. Dikes have been built along the lower course of the Beraun River below the city of Beraun. There are numerous river dams (artificial).

The construction of a large Beraun valley dam is planned near Puerglitz (Krivoklat) in order to improve the navigability of the Elbe River and to produce power. The subsequent canalization of the Beraun River for a length of 135 kilometers (as far as Pilsen) is further provided for.

Betschwa - Becva, Beczwa

Left tributary of the March (Morava); empties into the latter near Tobitschau (Tovacov); the two headwaters, Lower Betschwa (Dol. Becva, Roznovska Becva) and Upper Betschwa (Hor. Becva, Vsetinska Becva), join near Wall. Meseritsch to form the main river.

Obstruction: to a small extent below Maehr. Weisskirchen (Hranice). Along the upper course and the headwaters, the river is generally not an obstruction, depending on the water stage.

River bed: to Maehr. Weisskirchen, it is 40-50 meters wide and covered with gravel, over which only a narrow, shallow vein of water usually flows.

River bottom: stony, with course gravel, and rocky in spots.

Banks: generally flat and low; in places are formed by the valley slopes; from Wall. Meseritsch on, consist of a mixture of clay and gravel; are usually boggy and covered with shrubbery and trees.

High water stage: at this stage the Betschwa River and its headwaters are obstructions very difficult to overcome. High water stage always occurs in February/March (when the snow melts); also almost every year at the beginning of summer. High water stage occurring in the spring is 1 to 2 weeks in duration, and of a few days' duration in the summertime. The high water stage in summer exceeds that of the former, the water rising up to 5 meters above the medium water stage.

Valley Characteristics and Conditions:

Upper Betschwa (Hor. Becva, Vsetinska Becva).

Heights of Valley Elevations: wooded uplands and mountainous country, difficult to cross on foot.

Slopes of Valley: rather steep; as far as Vsetin, gullies are frequently worn into the sides. Between Hallenkau(Halenkov) and Austy (Usti) the slopes on the right side are steeper and more difficult to cross on foot; downstream from Austy, the slopes on the left side are steeper and more difficult to cross on foot. As far as Austy, the right side of the valley slope often is very close to the water, and rises very steeply for 20-30 meters above the base.

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Valley Floor: at first narrow; below Gr. Karlowitz (Vel. Karlovice), it is 450-700 meters wide, coverdd with meadows and arable land, and can be crossed on foot.

Crossings: 10 road bridges (BB 4260,Numbers 17,35), 9 foot bridges, 5 railroad bridges.

Valley Dam: construction planned on the Senice River near Luzna.

Lower Betschwa (Dol. Becva, Roznovska Becva)

Heights of Valley Elevations: uplands which, particularly on the right side, are densely wooded and very difficult to cross on foot.

Slopes of Valley: as far as Roznau a. R. (Roznov pod Radhostem), slopes are steep and jagged; often end close to the water with rocky edges; generally are wooded clear down to the foot; can be crossed only on roads and paths.

Below Roznau a. R., only the upper sections of the slopes are rather steep and wooded; towards the valley floor, there are extended, moderately sloping foothills which can be crossed on foot, and which are covered with arable land, pastures or woods.

Valley Floor: is 200-400 meters wide to Roznau a. R., and then widens to 1 kilometer. Situated close to the river are pastures and willow coppices; farther away from the river are meadows, fields and numerous trees. Can be crossed on foot.

Crossings: XXX 4 road bridges (BB 4260, Numbers 18, 26), 3 foot bridges, 1 railroad bridge (BB 4260, Number 68).

Betschwa, Main Trunk of the River (Becva)

Heights of Valley Elevations: partly flat, cultivated hilly land; partly wooded mountainous land, especially the right side between Bodenstadt (Potstat) and Gr. Aujezd (Vel. Ujezd). The valley is narrow from Cernotin-Kelc. to Maehr. Weisskirchen.

Slopes of Valley: on the right side, the slopes are, in general, gently rolling, cultivated and easy to cross on foot. (With the exception of the area between Cernotin and Maehr. Weisskirchen where the valley slopes end very close to the river, are steep and wooded.)

On the left side from Poliena to Hustopece, the slopes are moderately steep, covered partly with woods and partly with arable land, and are close to the river. Between Teplitz and Thein (Tyn), the slopes are steep, wooded XXX as far as the river, difficult to cross on foot, and close to the river; otherwise, the slopes on the left side are flat, cultivated and easy to cross on foot.

Valley Floor: is 2-3 kilometers wide as far as Leipnik (Lipnik n. B.); however, from the Cernotin-Kelc railroad station to above Kuehr. Weiskirchen, it is narrowed down to 75-100 meters. From Leipnik to Prerau (Prerov) it is 3-4 kilometers wide, and after that it consists of XXXXXXXXXXX the March River lowlands. Valley floor is mainly arable land with occasional meadows; above Prerau the banks are wooded; can be crossed on foot. Along the river there often are areas overgrown with willows.

Crossings: 11 road bridges (BB 4259, Number 36 and BB 4260, Number 19), 3 foot bridges, 2 railroad bridges (BB 4259, Number 2).

Bistric-Bach - Bystrice

Right tributary of the Cidlina River. Between Sedowa (northwest of Koeniggraetz) and the mouth of the river (at Chlumec), there are generally wet meadow valleys, the main course of the river is 2-3 meters wide and, at the most, 1 meter deep; floods occur often. At Muehlbach the river is 1-2 meters wide and 1 meter deep.

Blanitz - Blanice

Right tributary of the Wottawa (Otava). Downstream from Prachatitz there is a wide meadow valley, which is rather marshy west of Wodnau (Vodnany) (ponds, drainage and irrigation ditches).

Crossing: BB 4352, Number 38.

Width: 15 meters near Wodnau; north of Rotivin, 20 meters; frequently swampy meadowland as far as the mouth of the river.

Depth: river is shallow but the bottom is swampy.

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Crossings: see BB 4352, Numbers 64, 32a, 38, 83.

Valley Dam: near Husinec BB 4352, Number 31.

Cidlina

The river is of little importance along the upper course to Smidar (Smydary). Up to Chlumec, the middle course is an obstruction during the high water stage (very flat valley with flooded meadows). Recently much work has been done to regulate the river (construction of dikes). A valley dam is planned on the Javorka River near Bad Belohrad.

Eger - Ohre

Left tributary of the Elbe (Labe); empties into the latter east of Leitmeritz (Litomerice). Not until Saaz (Zatec) on is it an obstruction to a large extent.

Fordable at normal water stage, depending on the condition of the banks.

Width and Depth: see table.

River Bottom: gravelly and sandy.

Banks: as far as Falkenau (Falknov), are usually flat; farther downstream banks are high and steep; 3-6 meters high, sometimes up to 15 meters high; boggy; generally protected at bridges only.

High water stage: of 4-8 weeks' duration in spring; stays at its highest level only for several days. Often raises the water level by 4 meters; causes extensive floods downstream from Saaz (Zatec), particularly between Laun (Louny) and Postelberg (Postolprty), and then between Budin and Theresienstadt (Terezin). The high water stage in the summer subsides in 24 hours.

Low water stage: lasts from August to October.

Ice Cover: river is navigable from December to February.

Valley: about 1 kilometer wide as far as Falkenau; consists of slopes

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which can be crossed on foot; valley floor is usually wet and can be crossed on foot only during dry spells. Downstream from Falkenau the valley resembles a gorge. The slopes, which are to a large extent wooded, can generally be crossed only by infantry troops.

Until below Kaaden (Kadan), the valley is deep, narrow and has steep sides; downstream from Kaaden, it is 1,8 kilometers wide, on the average, and bounded by steep slopes. At the mouth of the river, from Theresienstadt on, the level area widens out.

Valley Elevations: the slopes on the right side are higher, with the exception of a stretch of land downstream from Budin.

Valley Floor: entire floor can be crossed on foot without difficulty with the exception of that area between Postelberg and Laun where such crossing is hindered by wet and swampy places. Crossing the very steep side valleys is very difficult, apart from using the regular road.

Obstruction: the river is not navigable and is an obstruction in parts; during wet weather, it is a severe military obstruction and then often very rapid. During low and medium water stages, it is fordable at many places. The river bottom is partialy rocky and partially sandy.

Valley Dam: with XXXXXXXXX high water reservoirs in the Eger River area: Tepl valley dam near Pirkhammer(BB 3950, Number 140).

Canalization: it is intended to make navigable the section of the Eger River from the city of Eger (Cheb) to the mouth of the river near Theresienstadt (Terezin) (distance of 244 kilometers).

To do this, the construction of many additional locks with sluices is necessary. At present (1937),

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only maintenance and repair work and the regulation of parts of the river is being carried out.

Summary: because it is deeply cut into the North Bohemian depression, the upper Eger valley is not to be underestimated as a defense sector. Along the lower course of the river, the only elevations along the side which can be said to form a natural barrier are those east of Laun (Louny) near Libochowitz; on the other hand, that section of the Eger River downstream from Kaaden appears to be a much greater obstruction.

At no place can the winding course of the river, along with the valley, be considered suitable for invasion.

General Information:

The Canalization of the Elbe in Bohemia (Status in 1937).

In connection with the plan for an Elbe-March canal between Pardubitz (Pardubice) and Olmuetz (Olomouc), the projects for the regulation of the upper and middle sections of the Elbe River have progressed to the extent that the sections of the river from:

Melnik-Kolin	planned completion date 1942
Kolin-Pardubitz	planned completion date 1948
Pardubitz-Jaromer	planned completion date 1948

are navigable for 1,000-ton craft. The water will then be 2.10 meters deep throughout the navigation channel.

The canalization of the lower Elbe, downstream from Melnik, was finished with the completion of the Schreckenstein (Strekov) locks in 1936. For details on construction and arrangement, see the separate river sections under the heading "Canalization".

With regard to Prague-Melnik as a navigable channel, see the heading "Moldau".

Most of the locks serve to produce electric power. If the dam installations or the main sluices do not coincide with the roads,

they can serve as river crossings only for pedestrians.

The water level of the upper Elbe, with the exception of the high water reservoir specified under (1), can be artificially controlled by the following valley dams on the tributaries:

1. Adler (Orlice)	BB 3956, Number 40 and BB 3957, Number 55
2. Chrudimka	BB 4055, Number 23 and BB 4056, Number 46
3. Donbrava	BB 4055, Number 45
4. Iser (Jizera)	BB 3754, Number 39, construction planned near Karlstal-Gr. Iser
5. Cidlina	BB 3855, construction planned on the Javorka near Bad Bolohrad.

Effects of Complete Opening of all Dams on the Elbe and Moldau

The 11 locks of the Prague-Aussig (Usti n. L.) together have a capacity for the storage of 25 million cubic meters (at water level plus 150 centimeters in Dresden).

In the case of war, the possibility would exist for the enemy to produce an artificial tidal wave by the well-timed, sudden opening of all 11 locks (especially the Masaryk lock, BB 3752, Number 92) as a measure of disorganization and destruction.

The wave would reach Dresden in about 8 hours and at its crest would carry 1,250 cubic meters of water per second above normal, which would mean an increase in water level of 3.7 meters or considerably more if the water level were already high.

The intensity, duration and effects of the artificial tidal wave could be increased still further through the 11 completed locks on the Elbe River above Melnik (total water storage capacity of 6 million meters), and the large dam installations near Vrane and Stechowitz(Stechovice) on the Moldau River above Prague. Also frequent repetitions of this artificially induced tidal wave are agreed to be possible.

This tidal wave would endanger shipping traffic and the installations for river control, and particularly any pontoon bridges which might be built. The Czechoslovakian territory between Aussig

and the border would be affected to the greatest extent.

Effects of Complete Shutdown of the Dam Installations

The possibility exists of stopping the flow of water on the Elbe River (capacity: 45 million cubic meters at water level plus 150 centimeters in Dresden) for about 2 days by completely closing all dam installations.

By this means, the water would drop to such a low level in the middle course of the Elbe River that the entire shipping traffic, every military transport and all harbor traffic of the Elbe would be paralyzed. Complications arising from this situation would be in effect for some time.

If then the dam installations were suddenly opened, the resultant tidal wave would produce catastrophic consequences.

1. From the Source to Jaromer (79 kilometers)

River Bottom: rocky as far as Hohenelbe (Vrchlabi); near Arnau (Hostinne n. L.) it is covered with coarse gravel, later with finer gravel.

Banks: to Hohenelbe and in the gap above Koeniginhof (Dvur Kralove n. L.), they are rocky, otherwise boggy, 1-4 meters high.

Valley: near Arnau it is surrounded by low, open uplands. Downstream from Arnau the river cuts through the rocky section (artificial lake) of the wooded plateau of the Koenigreichwaldes (Kralovstvyi les). Near Koeniginhof the valley opens up into a basin, 1.5 kilometer wide, the southwest elevations of which rise steeply. Downstream from Koeniginhof, the slopes of the valley are again close to the river for a short stretch.

Obstruction: constitutes a military obstruction only during the high water stage and in the vicinity of the Krause-Bauden (BB 3755, Number 36) and Koenigreichwald (BB 3855, Number 97) valley dams and artificial lakes.

Crossings: 22 road bridges (BB 3755, Number 36 and BB 3855, 97); 3 railroad bridges.

Valley Dams:

Elbe high water reservoir in Krause-Bauden (BB 3755, Number 36)

Elbe high water reservoir in Koenigreichwald (BB 3855, Number 97)

Aupa high water reservoir in Boehm. Skalitz (BB 3856, Number 94)

These completed installations serve to store the amount of water necessary to maintain a uniform water level for navigable channels, to prevent flood damage and to produce electric power X (the latter, in part, will not be provided for until later).

2. Jaromer - Pardubitz (Pardubice) (60 kilometers)

The preceding data will no longer be applicable after the completion of the projects for the regulation and canalization of the river, and will vary according to the river volume and the dam installations.

See "Canalization of the Elbe".

River Bottom: gravelly or sandy to Koeniggraetz; sandy farther downstream.

Banks: are usually strengthened river walls or dirt embankments packed with stones, at a thirty degree slope. North of Pardubitz they are from 1-4 meters high; on the left side of the river, 3.1 meters high.

Valley: above Josefstadt (Josefov), widens out to 6 kilometers; is bordered by hills and terraces which are easy to cross on foot, and which, below Koeniggraetz, contrast strongly with the steep slopes on the left bank and the steep, rocky slopes opposite Lukovna on the right bank.

Valley Floor: downstream from Josefstadt, the crossing of the valley floor on foot is hindered in places by the wet meadows, pools, stagnant forks and brushwood.

Crossings: see preceding table.

Locks and Canalization: about 32 kilometers of the 60-kilometer river channel are already regulated. 5 locks

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with sluices are being planned, are under construction or have been completed. See above table.

3. Pardubitz - Melnik (1-6 kilometers)

The following numerical data pertain to the conditions before canalization which is now underway. After completion (See above, "Canalization of the Elbe"), one can plan on uniformly regulated width, depth (minimum of 2.10 meters) and current, if the weirs are not opened but operated according to schedule.

River Bottom: sandy and gravelly; also rocky near Elbeteinitz (Tynec n. L.), Neukolin and Nimburg.

Banks: 1-4 meters high, usually strengthened river walls or dirt embankments packed with stones, at a thirty degree slope. Frequently steps have been built into the banks.

High water stages: since the completion of the high water reservoirs on the upper Elbe and on its larger tributaries, Aupa (Upa), Adler (Orlice), Chrudimka, Doubrava XXXXXXXXX and Iser (Jizera), catastrophic floods can be avoided.

Obstruction: a definite obstruction throughout the regulated portion of the river (XXX navigation channel, 2.10 meters). There is no information on the unregulated portion of the river bed.

Valley Floor: about 4 kilometers wide, covered with meadows and fields.

Valley Elevations: not pronounced near Pardubitz; downstream from Pardubitz on the left bank are very high slopes, and on the right bank are only sandy XX hills and undulating slopes.

Near Elbeteinitz (Tynec n. L.), the Elbe flows through a ridge which extends in a southern direction. Along the left bank between Nimburg and Celakovice, are several hills (Hora and Bila Hora).

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Downstream from the mouth of the Iser River and on the right bank, a terrace begins which soon increases in height and extends to Melnik. At the latter point, its steep walls precipitate directly to the river. Located in this area on the left bank until below Neratovice, are open plateaus close to the river. The left bank is generally higher to Neratovice, and from here on the right bank is higher.

4. Melnik to the border (103 kilometers)

The kilometer measurement of the Elbe River begins here (zero is at the junction with the Moldau River). The individual tenths of kilometers are indicated by white stripes on the slopes of the banks, which are easy to distinguish from the kilometer markers.

The numerical data as to depth and velocity apply to the conditions before canalization. At normal water level the overall depth in the navigation channel is at least 2.10 meters. Only if the locks in the main sluices are not in operation and open, can, in general, the given figures be used. In regard to this, see the profile of the river length on page 53.

River bed: regulated. Frequent island formations; flat shingle banks.

River bottom: gravelly; rocky in places from Aussig (Usti n. L.) on.

Banks: usually along the banks are plastered quays which rise above the normal water level by 1.7-7 meters.

High water stages: regularly in the spring the water level is raised 1.3-2 meters above normal.[D] Floods at time of ice breakups cover a limited amount of space only and subside quickly.

Ice Cover: frequently is of 2 months' duration in winter.

[D] Depending on the actual capacity of the high water reservoirs in the headwater regions of the Elbe, Aupa, Adler, Chrudimka and Iser Rivers at the time, and on the regulation of the dams.

Obstruction: not fordable at any place; the nature of the valley makes it more of an obstruction.

Passenger and automobile ferry boats: numerous.

Valley: varies in width to Lobositz (Lovosice), at which point it becomes considerably wider on the left bank (the highly cultivated plains of Theresienstadt).

Valley floor: near the junction with the Moldau River, there are marshy woodlands. Otherwise generally sandy and cultivated.

Broader parts of the valley: densely settled.

Valley slopes: are, for the most part, steep; those on the left side are also rocky. However, downstream from Melnik on the left side, they draw back from the river for a distance of 1.5-7 kilometers and low, flat country is alongside the river. The slopes on the right bank are higher.

In general, both sides of the flat upland area bordering the river can be crossed on foot.

Downstream from Lobositz where the river cuts through the Bohemian uplands, the valley slopes are steep, wooded or rocky. River also cuts through the Elbsandsteingebirge.

Navigability: between Melnik and the Czechoslovakian border, the Elbe is regulated, has canals and is already navigable. Throughout the navigation channel the water is 2.1 meters deep, and later on is to be increased to 2.5 meters. See table on pages 50/51 for the locks VI-XI.

Igel - Iglawa, Jihlava

Right tributary of the Zwittau River (Svitava); empties into the latter at Muschau (Musov).

Obstruction: to a small extent between Iglau (Jihlava) and Wladislau (Vladislava) because of dams; otherwise the river is fordable.

Width: 4-20 meters above Iglau; 20-15 meters up to Wladislau; 20-10 meters up to Elbenschitz(Ivancice); 30-30-50 meters up to the mouth (20 meters wide near [redacted] Pohrlitz - Pohorelice).

Valley Elevations: hilly-type country. Slopes which descend steeply surround a narrow valley (especially between Wladislau and Biskoupka). Downstream from Kanitz (Dolni Kounice), the valley elevations are flatter and cultivated and there is a gradual transition to undulating land which is easy to cross on foot.

Valley slopes: to Wolframs (Kostelec), they are moderately steep slopes which are cultivated and can be crossed on foot. Farther downstream, the slopes rapidly increase in steepness. Between Iglau and Wladislau they are 30-50 meters high, wooded in sections, frequently very difficult to cross on foot. In the Wladislau-Biskoupa section, the valley slopes come very close to the water, are steep, occasionally also rocky, are wooded all the way to the base, and are generally almost impossible to cross on foot. Farther on to Kanitz, they are also quite steep and rocky, XX especially on the right side downstream from Elbenschnitz where they are very close to the river and, for the most part, are wooded all the way to the base. Downstream from Prahlitz (Pravlov), the valley slopes are very flat, cultivated and easy to cross on foot. The slopes on the left side are higher.

Valley Floor: narrow to Kanitz; averages 75-150 meters

in width. Widths of the valley are up to twice those XXXXXXX of the valley floor and even wider near Eibenschitz and above Kanitz. The valley floor is almost entirely covered with meadows and also with arable land in wider places. Downstream from Kanitz, the valley floor broadens out suddenly to a width of 2-3 kilometers, and near Eibis (Ivan) joins with the Thaya valley (Dyje). It consists of meadows and arable land; extending along the river are 1-1.5 meter wide, dense valley flats which considerably impede crossing on foot.

Crossings: 10 road bridges (DB 4356, Numbers 3,8; DB 4355, Number 5).

18 railroad bridges (DB 4356, Number 25).

Iser - Jizera

Right tributary of the Elbe River; empties into the latter near Altbunzlau (Stara Boleslav).

Obstruction: because of the nature of the valley and at high water stage periods, the river is an obstruction.

Width: 15-30 meters; downstream from Neu-Benatek (Nove Benatky), it is 30-53 meters wide.

Depth: because of the many weirs, it alternates XXXX between .6-2.5 XXXX meters.

River XX Bottom: in the upper course of the river, it is rocky in parts; otherwise gravelly and sandy.

River bed: downstream from XX Turnau (Turnov), its cut into the valley floor is U-shaped.

Banks: generally boggy; along the upper course of the river, they are also rocky and 1-3 meters high; between Turnau and Muenchengraetz (Mnichovo Hradiste), they are up to 13 meters high in places.

Velocity: .6-1.6 meters per second.

High water stage: a normal occurrence in the spring;

also occurs in the summer, floods the valley floor and lasts for 2 days, but the floor cannot be crossed on foot for some time. Up to 2 meters above medium water stage.

Characteristics and Conditions of Valley:

Along the upper course of the river up to Turnau, it is narrow, has steep slopes and is usually wooded. Downstream from Klein-Skal (Mala Skala), sandstone cliffs, 190-230 meters high, are cut into the valley.

Along the middle course of the river (Turnau to Bakov), the valley is .5-2 kilometers wide.

Valley Floor: is often wet.

Valley Slopes: on the right side, consist of continuous sloping surfaces; on the left side, they consist of sharply jutting, steep slopes and precipitous cliffs which tower over the valley plains. North of Muenchengraetz the Kacovberg (Kacov Mountain) protrudes in isolation. For the most part, the slopes on the right side of the valley are higher; those on the left side are higher only at Turnau and between Sichrov and Muenchengraetz.

Along the lower course of the river, downstream from Bakov to the Elbe lowlands, the valley resembles a ditch deeply cut into the ground.

Valley Floor: often wet; up to 2 kilometers wide.

The slopes on the right side of the valley are often rocky, up to 30 meters high, and are broken up by side valleys resembling gorges. The elevations on the left side at first consist of the higher Kosmanos (Kosmonosy), and then to Brodetz, of steeply protruding, partially wooded slopes. The latter slopes are at first as high as those on the right side of the valley, but, farther on, they flatten out. In the wet Elbe lowlands

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on both sides of the Iser River, large woodlands branch out (cannot be crossed on foot; no paths).

Summary:

Above Turnau the terrain on either side of the Iser River consists of uplands, and vehicles of all types are restricted to travel on roads. The 200 meter deep mountain valley which the Iser River cuts into is a considerable obstruction in this area; the river itself and the valley floor are less of an obstruction. The valley is better suited for flanking operations than for frontal defence (front line covered at several points, narrow valley curves, and no fire range because of arched slopes and overgrowth).

Crossings: at medium water stage, the river is fordable at many places in spite of the strong current. At low water stage, the river is fordable almost everywhere.

To Turnau: 16 road bridges; 7 railroad bridges (BB 3754, Numbers 4, 5).

From Turnau on: 25 road bridges (BB 3754, Numbers 6,26,61,25; BB 3854, Numbers 30, 9,28; BB 3953, Number 27);

8 railroad bridges (BB 3754, Numbers 7; BB 3854, Numbers 8,10,11).

Hydroelectric Power Plant Draschitz (Drazice) (BB 3854, Number 54).

Javorka

Left tributary of the Cidlina River. At the mouth (north of Smidar (Smydary)), it is 3 meters wide; numerous drainage ditches.

Lomnitz - Lomnice

Left tributary of the Wottawa (Otava). Not well supplied with water and of little importance; however, the meadow valley is generally wet, and during high water stage can be crossed on foot only at bridges. There is a bridge on the Prague-Pisek road (BB 4254, Number 43).

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Luschnitz - Lusnice

Right tributary of the Moldau (Vltava); empties into the latter near Moldauthein (Tyn n. Vlt.)

Obstruction: at medium water stage, the river is not too great an obstruction and is often fordable; its average width is 25-30 meters.

Valley: along the upper course of the river until north of Sobeslav, it is flat, wide and there are frequently swampy valley plains, overgrown with bushes (see I, 36).

Lower Course of River: cuts deeply into the ground and is narrow.

High Water Stage: river is often very rapid, at which time putting up a bridge and crossing can be very difficult.

Valley Slopes: densely wooded and steep; there is a deep gorge near Tabor.

Crossings: 13 foot and road bridges (BB 4454, Number 22; BB 4353, Numbers 21, 63; BB 4253, Numbers 1, 11,19); 3 railroad bridges (BB 4353, Number 52).

March - Morava

The largest river in Moravia, and the one with the most volume of water; empties into the Danube north of Theben(Devin).

Section of River	Total Gradient in Meters
1. To Napajedl	153
2. To Goeding (Hodonin)	39
3. To the mouth near Theben (Devin)	30

Canalization

The March River, which flows through broad, flat lowlands, is still almost in a primitive state with regard to the river bed, ~~XXXXXX~~ regulation of the banks and navagibility. The first regulation project will strive to attain a minimum river depth of .7 meters, in order to at least make the river navigable in all parts for flatboats.

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The gradient amounts to 12-17 centimeters per 1,000 meters (.12 - .17 per cent). However, the cut-off canals which have already been partly constructed (for example, the one near Uh. Hradiste with a canal lock for 150-ton craft), increase the gradient, and through this the velocity of the river is gradually increased. After completion of the regulation, the section of the river from Olmuetz to Kremsier will be 29 kilometers in length (formerly 32 kilometers), and that from Kremsier to the confluence with the Thaya River will be 103 kilometers long (formerly 130 kilometers). The Olmuetz-Devin section will be 197 kilometers in length (formerly 246 kilometers). Frequently there is localized protection by dikes of the river banks and areas subject to flooding.

Between Ostrokovice and Goodin (Hodonin), a navigation canal, 46 kilometers long, has almost been completed by the use of part of the shortened river bed. At the north end is located the harbor of the Bata plant in Batov, and an auxiliary canal branches off from the main canal to the plant. The bottom of the canal is 6-13 meters in width. The width at the water surface is 10.5 to 16.5 meters. The canal is 1.5 meters deep and has 13 locks. Can accomodate 350-ton ships, 35 x 5 meters in dimensions, and which draw 1.3 meters of water. (construction for enlargement is planned so as to accomodate 1,000-ton craft). The extension of the canal to Devin will presumably be constructed on more elevated Slovakian territory, and is scheduled for completion by the end of 1940.

1. From Littau - Litovel to Napajedl

Obstruction: to a very limited extent during normal water stage periods.

Width: 30-100 meters.

Depth: very fluctuating (because of weirs); to Olmuetz(Olomouc) not over 1.8 meters; farther downstream up to 5 meters.

High Water Stage: occurs regularly in the spring; also during storms and in the autumn; subsides after a few days.

Ice Cover: in the winter at 5 degrees below zero, the ice can be crossed by heavy vehicles. Ice breaks up in February.

Fords: numerous in the section above Tobitschau(Tovacov).

Valley: generally broad.

Valley Floor: numerous deciduous wooded areas, stagnant pools of water, swamps, ditches, water veins; very difficult to cross on foot.

Height of Valley Elevations: from Olmuetz to Napajedl the elevations on the right bank are higher. The elevations on the right side, usually open and easy to cross on foot, are close to the river in this area and have a steep angle of descent.

2. From Napajedl to Goeding - Modonin

Width: 35-105 meters.

Depth: 1.1-3.7 meters.

River Bottom: sandy or muddy.

Banks: generally high and bodgy.

Fords: near Ung. Hradisch (Uherske Hradiste).

Valley: narrows down to 400 meters near Napajedl. Farther downstream it broadens out: to 3 kilometers near Ung. Hradisch; to 5 kilometers near Wessely (Veseli). Near Goeding the valley again narrows to 3-3 (sic) kilometers.

Valley Floor: frequently marshy; numerous water veins and forks (stagnant arms) pass through it; covered with flood plains; in general, very difficult to cross on foot.

Valley Slopes: steep at Napajedly only; are mostly XXXX far away from the river and are easy to cross on foot.

3. From Goeding to the Mouth

Obstruction: at normal water stage periods, it is, in general, not fordable.

Width: 50-80 meters to Duernkrut; 80-130 meters to Marchegg, and from here to the mouth, it is 150-400 meters wide.

Depth: very fluctuating; 1.2-2.5 meters deep from the confluence with the Thaya River to Duernkrut; 1.5-3.5 meters deep (at medium water stage) to the mouth.

River Bottom: sandy; covered with mud. In some places the layer of mud is 1-1.5 meters high.

Banks: to Marchegg (Austria) banks are boggy and 1-5 meters high. Are mostly covered with grassy plains; farther downstream, banks are flat and covered with sand.

High Water Stage: in the spring and autumn for 10-14 days; floods broad stretches of the valley floor, particularly at the confluence with the Thaya River; water rises about 1.5-3 meters.

Floods: sometimes occur along the lower course of the river because the Danube causes the waters to back up; water rises up to 6 meters.

Ice Cover: field artillery can be transported across it.

Ice Breakup: end of January and beginning of February.

Fords: at Kopcany and Hohenau (Austria) during normal periods of water stage. During low water stage the lower course of the March can also be forded in places, for example near Angern (Austria).

Valley: 3.8 kilometers wide near Gooding; 4.5 kilometers wide near Landshut (Lanzhot); 7-8 kilometers wide near Hohenau (Austria).

Valley Floor: loamy or sandy; has many flood plains and water veins; difficult to cross on foot.

Heights of Valley Elevations: low, gently sloping, well cultivated. Downstream from the confluence with the Thaya to Angern (Austria), the slopes on the right (Austrian) side are close to the river and descend to the valley floor with steep mud walls. Downstream from Theben-Neudorf (Devin-N. Ves), the slopes on the left side drop steeply to the river. Downstream from

Marchegg (Austria), the slopes on the left (Czechoslovakian) bank are higher.

Ferries: numerous; can accommodate up to 300 passengers.

Possibilities of crossing over on foot from right to left bank between Angern and Duernkrut (including both towns) are favorable; otherwise generally unfavorable.

(Table on page 57)

Additional Information

Formerly there was a road bridge and 150 meters below it, a ford.

Fords in the upper and lower parts of the river.

Formerly there was a road bridge.

Banks are strengthened; there generally is cover.

Mies - Mze

Left tributary of the Berann (Berounka) River; the confluence is at Pilsen. Of minor importance. Narrow; surrounded by trees; becomes somewhat wider shortly before Pilsen (Plzen). Generally not much of an obstruction.

Crossings: 13 foot and road bridges; 7 railroad bridges.

Mohra - Moravice

Right tributary of the Oppa. Is just as great in volume as the latter, and at high water stage it is an obstruction because it becomes swollen rapidly. At medium water stage it is usually .5-1 meters deep. Cuts into a narrow, spiral valley with steep, wooded slopes.

Road bridges: BB 4059, Numbers 65, 62, 66, 71; BB 4060, Numbers 72, 73, 74, 77.

Moldau - Vltava

Left tributary of the Elbe; empties into the latter near

Melnik; has the most water volume and is the longest river in Bohemia.

1. Headwaters

Warme Moldau - Tepla Vltava. Headwater region is at an elevation of 1,300 meters, is marshy (also see I 1), is 2-10 meters wide, and is fordable with the exception of small natural dams. At the high water stage (.4 meters above normal), meadows are inundated; meadows are often wet also during medium water stage. River bottom is generally firm, marshy and covered with peat mounds in parts.

Crossings: BB 4451, Numbers 81, 74, 79, 80; BB 4452, Number 26.

Grosige Moldau or Wolfau-Bach(Wolfau Stream), east of Kuschwarda (Kunzvart), flows through swampy lowlands; has a valley dam, construction of which is not completed, with a 10-meter wide break; after a short narrow stretch, the river leads into marshy land near Pumperle.

Kalte Moldau - Studena Vltava.

(Table on Page 60)

Remarks

Generally narrow, partially rocky river bed.

Has abundant flow of water only after rains and when the snow melts.

Valley broadens out; wet meadow.

River bottom is sandy and marshy in parts.

Between Schwarzes Kreuz and Parkfried, there are swampy, peaty meadows (Tote Au), which, even in dry weather, can be traveled by light vehicles only. The construction of a valley dam near Salnau (Zelnava) is planned for the very near future (1938), and the artificial lake, formed therefrom, is expected to extend west of Wallern.

2. Upper Moldau from Humwald (Ohlum) to Hohenfurth (Vyssi Brod)

(Table on Page 61)

Remarks

Banks are regulated; velocity of current is .5 meters per second.

Right bank: meadows. Left bank: poor field path.

Right bank: poor field path. Left bank: good field path.

Both banks: field paths.

Right bank: ground is not firm. Left bank: field paths.

River bottom is sandy and marshy.

Approach by road on both banks.

River bottom is loamy and marshy.

Approach by road on both banks.

River bottom is loamy and marshy.

Both banks: poor field paths.

River bottom has coarse gravel and is somewhat loamy and marshy in parts; banks are steep.

River bottom is sandy and gravelly; banks are steep; velocity of current is .5 meters per second.

Both banks: field paths.

Steep banks which are marshy in parts.

Peat mounds.

River bottom is sandy and loamy; banks are steep.

(Table on Page 61a).

Remarks

River bottom is sandy and marshy; banks are steep.

Banks are regulated; velocity of current is .5 meters per second.

Right bank: ground is not firm. Left bank: firm ground.

Banks are regulated; velocity of current is .5 meters per second.

River bottom: firm sand and gravel bed; banks are flat; valley becomes narrow and rocky; there are rapids

(Teufelsmauer - Devil's Wall, e.g. Blankenburg/ Harz).

Auxiliary canal (with crossings leading to the paper factory and power plant) cuts off from the Moldau bend.

River bottom is stony; banks are regulated; velocity of current is .7 meters per second.

Summary: At normal water stage, the Moldau is fordable at many places; at high water stage, the river is a considerable obstruction. High water sets in rapidly after rain and when the snow melts, but subsides quickly. Flooded meadows stay wet for a longer period of time. The narrow valley below Neuhaeusl would impede troop movements considerably.

3. Upper Moldau from Hohenfurth - Vyssi Brod to Boehm. Budweis

(Table on Page 62)

Remarks

Steep slopes on left side of valley; valley becomes more narrow.

River bottom is sandy and gravelly; banks are regulated. Velocity of current is .6-1 meter per second.

Similarly a sandy river bottom.

Rocky gorge. Slopes on east side are often interrupted by moderately steep, wooded slopes and slopes covered with meadowland. Part of the road has been blasted into the rocks.

River bottom is sandy and gravelly; river bed cuts deeply into the ground. There are a few rocky slopes; otherwise usually steep and extremely steep, grassy slopes which flatten out at the top.

Velocity of current is .7 meters per second.

Broad, open meadow valley. River is up to 100 meters wide in places; river bottom is marshy.

Near a power plant.

Summary: as for 2. Downstream from Hohenfurth, the Moldau is navigable for 400-650 ton ships, provided the water stage conditions are favorable. There are numerous fords at normal water stage.

4. Middle Moldau from Boehm. Budweis - C. Budejovice to the junction with the Sazawa - 169 kilometers; total gradient is 184 XX meters.

(Table on page 63)

Remarks

Flat meadowlands. Protected by dikes on both sides. Regulation work has been done.

Forms a lake. Velocity of current is .5-.7 meters per second. There are some fords at XXXXXXX normal water stage. Constriction of the valley.

Banks are partially inaccessible. Downstream from Purkarec, there is a foot path on the left bank.

Valley is 500-600 meters wide. Below Moldauthein valley is always deep, has steep slopes; the roads have sharp curves. Traffic through the river valley is not possible.

Same.

Same.

Very narrow valley. Steep slopes below Orlik Castle.

Valley broadens out for a short distance; then again becomes a very narrow wooded gorge, which will later be the site for construction of an artificial lake. At present there are rapids (St. Johann) here.

(Footnotes to Table on page 63).

1) Regulation projects 1938

2) The deepening of the Moldau River bed below Budweis is planned and has been started.

3) Connected with the ferry terminal for crossing the Mottawa (Otava) by a paved road.

At this point, the Moldau is no longer fordable. Navigable from Boehmisch Budweis on. Downstream is navigable for ships from 400-650 tons. Between Pohlrad and Stechowitz. Between Podhrad and Stechowitz rocky reefs render navigation more difficult. Steamboats travel from Stechowitz to Prague.

The plan for canalization of the middle section of the Moldau upstream to Budweis was started in July 1937 with the beginning of the construction of the Stechovice locks (BB 4053, Number 19). Construction of the following locks is planned (upstream).

Upon completion of this project, the Moldau will dam up a total volume of 616.3 million cubic meters of water, and will be a considerable obstruction. The section from Vrane to Kamyk will supposedly be navigable for 1,000-ton craft.

5. Moldau River from the Junction with the Sazawa River to the Confluence with the Elbe River

(Table on Pages 64 and 65)

Remarks

The Moldau valley as far up as Stechovice is filled by the artificial lake formed by the series of locks at Vrane.

On the left bank is a wide road for motor vehicles (see VI, Number 1).

River bottom is at first stony and then sandy.

Banks are generally regulated, 2-3 meters high.

Harbor.

Firm river walls which suffice for all water stages.

Harbor.

Harbor.

Firm river walls which suffice for all water stages.

Harbor.

Regulation work has been done.

Harbor.

River bottom is gravelly.

Rocky in places.

Harbor.

Illustration 39.

(west of Voltruay), harbor.

Branching out of the Moldau navigation canal.[2]

Harbor.

Junction of the Moldau with the Elbe.

Junction of the auxiliary canal with the Elbe.

(Footnotes on page 65)

[1] Locks are not sufficient; construction of a weir with a power plant in Podbaba is planned to replace the former. Regulation work to be done near Troja in 1938.

[2] The auxiliary canal between Vranany and Horin (BB 3853), 9.8 kilometers long, is 18.4 meters wide at the bottom and [redacted] 2.5 meters deep. The bottom and slopes of canal are strengthened and partly lined with concrete. The angle of incline of the underwater slopes is 1:2. Crossings: 3 road bridges, 5 foot bridges, 1 railroad bridge (to Luzc sugar refinery).

High water stage: normally occurs in the spring; high water stage in the summer raises water level up to 3 meters (see length profile, page 53), but gives rise to floods

only at the confluence with the Beraun River, near Prague-Liben, Veltrusy and Vranany.

Low water stage: usually from September to November.

Navigable for 1,000-ton ships; steamboat traffic.

Oder- Odra

Originates in the southern part of the Moravian chain of mountains (Oderwald - Oderske vrchy). Its course through Czechoslovakian territory is as follows:

(Table on Page 66)

Additional Information

To Odrau there is a narrow mountain valley; has villages with houses built along a single street (Kaltes Odertal). River bed is regulated. Not an obstruction. Valley slopes are steep and wooded. Downstream from Odrau the meadow valley broadens out; is frequently wet. Fruit orchards.

Swampy wooded plains. Valley plains are 2-3 kilometers wide. Drainage ditches; there are fish ponds at intervals which are protected by dikes.

The flow of water is checked several times by river weirs. (velocity of current averages 2.5 meters per second.)

Meadows and wooded plains. The area subject to flooding is protected by dikes. Drainage ditches.

River flood plain narrows down (1 to .5 kilometers). Banks are steep and 1 to 2 meters high.

Junction with the Oppa (has approximately the same water volume as the Oder). River bottom: fine

gravel and sand.

Banks are 1 to 3 meters high, flat, boggy. Velocity of current is 1 to 1.8 meters per second.

Junction with the Ostravice.

Gravel banks and islands.

Banks are 1.5 to 3 meters high; rise perpendicular to the river.

Velocity of current is .8 to 1.6 meters per second. River bottom: fine gravel and sand.

Banks are 3 to 5 meters high; rise perpendicular to the river.

Regulation of the river: Large projects for river regulation are under preparation. The canalization of the section of the Oder River from its junction with the Opavice to the border (13.5 kilometers) is currently underway. The weir above Koblau (Koblov) (BB 4060, Number 167) was completed in 1937. Valley dams are planned near Kreuzberg (Kruzberk) on the Moravice, which is to have storage capacity of 25.5 million cubic meters of water, and near Sponau (Spalov) on the upper course of the Oder, which is to have storage capacity of 135 million cubic meters of water. These installations are to furnish the water supply for the planned Oder - Danube canal and the Oder River itself, and also serve to provide hydroelectric power. Construction was started in 1937. The actual work of making the river navigable will not be begun before 1943.

Oppa -Opava

Left tributary of the Oder. Drains large parts of the "Hohen u. Niederen Gesenkes" (Upper and Lower Jesenik). When the snow melts and during heavy rains, the Oppa rises greatly and is at this time a considerable obstruction. At the medium water stage, the Oppa is fordable in most places (.5- 1 meter deep). Downstream from Jaegerndorf (Krnov), there is a broad meadow valley which becomes flooded

high
a[redacted] water stage.

Road bridges between Jaegerndorf and Troppau (inclusive): 11.

Road bridges between Troppau and the mouth: 5 (RB 4060, Numbers 81, 89, 78).

Ostravice

Right tributary of the Oder; originates in the Beskids. Coming from rocky mountain valleys, the Ostravice flows through an extended scree slope area, therefore carrying much debris along with it (steep gradient). Along the lower course of the river the ground is loamy. The Ostravice is an obstruction only during the high water stage.

Polzen - Plouenice

Right tributary of the Elbe; empties into the latter near Tetschen (Decin).

Obstruction: only in the section downstream from Niemes [redacted] (Mimon) is the river a considerable obstruction as a result of the nature of the valley and at high water stage.

Width: 12-25 meters.

Depth: 1-5 meters (water is held back in many places by weirs); construction of a valley dam is planned near Boehm. Leipa (C. Lipa); downstream from this point, the river is not as deep.

River Bottom: muddy; downstream from Boehm. Leipa, the river is gravelly and rocky in places.

Banks: boggy, 1 meter high; downstream from Boehm. Leipa, the banks are rocky in places and often coincide with the valley sides.

High water stage: normally occurs in the spring; otherwise also in the summer. Since regulation of the high water stage of the bed of the Polzen River (by walling up), only the valley floor between Niemes and Boehm. Leipa is flooded and then very seldom.

Valley: narrow along the upper course of the river. Broadens out near Wartenberg (Straz pod Ralskem) to an artificial

lake which has already been completed (BB 3753, Number 36). The continuation of the valley to Reichstadt (Zakupy) is a gently sloping meadow valley. The valley basin of Boehm. Leipa is frequently wet. From Sandau (Zandov) on, the valley slopes are steep; they are generally wooded and are close together.

Crossings: 14 foot and road bridges (BB 3753, Number 36); 4 railroad bridges (-). Valley dam near Wesseli (Veseli) (BB 3753; Number 67); artificial lake near Wartenberg-Niemes (BB 3753, Number 36).

Radbusa - Radbuza

Forms the Beraun River (Berounka) by its confluence with the Mies (Mze) and Angel (Uhlava) Rivers.

Near Sirb (Srby) and west of Bischofteinitz (Horsovsky Tyn), the river is dammed up and rather wide. Farther on to and below Bischofteinitz, the river is of little importance.

Crossings (from Radonice and on downstream): 10 road bridges (BB 4150, Number 99; BB 4151, Numbers 31, 70); 5 railroad bridges (BB 4151, Number 10).

Sazawa - Sazava[D]

Right tributary of the Moldau; empties into the latter near Dawle (Davle).

Obstruction: insignificant to Ledec; downstream from this point, the river is an obstruction because of the nature and conditions of the valley.

Fordable: everywhere above Kacov.

Width: to Kacov, it is 19 meters wide; farther downstream it is 34-56 meters wide.

Depth: to Kacov, it is at first .8 meters deep and later it is .8-1.7 meters deep; downstream from Porici n. Saz., it is up to 3 meters in depth. The artificial lake formed by the Vrane locks (BB 4053, Number 20) extends for 3 kilometers into the mouth

Footnote
35- D Moravian Sazawa (Moravska Sazava); see under "Zahsee".

of the Sazawa.

River Bottom: stony along the upper course of the river; gravelly along the middle course; sandy along the lower course.

Banks: alternately flat and steep.

High Water Stage in the Spring: floods the valley floor; often is 3 meters deep and lasts about 14 days.

Suitable for use of rafts beginning near Svetla, north of Saz.

Navigable: only close to the mouth.

Valley: predominately narrow, particularly downstream from Ledec and in the vicinity of the mouth of the river.

Valley Slopes: generally steep; often rocky between Ledec and Kocerad (Chocerady); downstream from Sternberg (O. Sternberk), densely wooded.

Valley Floor: is 75-100 meters wide to Ledec, and has many wet places. Farther downstream, valley is usually confined to the river bed.

Valley Elevations: higher on the right side; extensively wooded and steep.

Crossings: 23 road bridges (BB 4156, Number 9; BB 4154, Number 4; BB 4053, Number 100); 15 railroad bridges (BB 4053, Number 34).

Hydroelectric power plant Krhanitz (BB 4053, Numbers 201, 201a) and Ledec.

Between Cercany (north of Benesov) and the mouth (32 kilometers), preparations are being made for canalization. Near Pikovice - about 3 kilometers above the mouth of the river - in connection with the construction of the Moldau River locks of Stechovice (BB 4053, Number 19), a channel is being constructed which leads in the direction of the site on which a power plant is to be erected. This

power plant is to utilize the water power of both rivers.

Schwarzawa - Svratka

Left tributary of the Thaya (Dyje); empties into the latter near Muschau (Musov).

River Bed: on the whole, has not been regulated much; downstream from Bruenn (Brno), it is regulated; Between Raigern (Rajhrad) and Wojkowitz (Vojkovice), there is a cutting, 30 meters wide, which is similar to a canal.

Width: 4-15 meters wide to Stepanov; 15-20 meters wide to Bruenn; 30 meters wide in the regulated section.

Depth: .2-.5 meters deep to Bruenn; 1 meter deep in the regulated section.

River Bottom: gravelly to Bruenn; downstream from Bruenn, it is gravelly, muddy in parts; downstream from Branowitz (Vranovice), it is a mixture of slate, sand and mud.

Banks: composed of a mixture of earth and gravel; to Tischnowitz (Tisnov), they are not over 1 meter high; between Tischnowitz and Bruenn, they are 1.5-2 meters high; frequently are formed by the valley slopes themselves; downstream from Bruenn, there are quays 4-6 meters high.

Velocity: .2-.5 meters to Bruenn; farther downstream, .1-.3 meters.

High Water Stage: when the snow melts and during the summer months; subsides rapidly.

Ice Cover: thick.

Valley Elevations: to Bruenn, hilly and mountainous elevations surround a narrow valley. Upper parts of the elevations are usually wooded. Slopes are generally cultivated. Crossing on foot is difficult because of the very deep valleys. Below Bruenn there is

flat cultivated, undulating land which is easy to cross on foot. Downstream from Seelowitz (Zidlochovice) on the left side, the land again becomes hilly.

Valley Slopes: to Bruenn, slopes are steep, for the most part wooded, and difficult to cross on foot. Near Eichhorn-Bittischka (Veverska-Bityska), they are densely wooded down to the river; their bases are usually very close to the river and are precipitous or rocky. In the broad parts of the valley, the slopes, as a rule, are gently rolling, cultivated and easier to cross on foot. Vineyards are often planted on the slopes on the left side of the river between Seelowitz and Nusslau (Nosislau), and between Auerschitz (Uhercice) and Pausraum (Pouzdrany); this hinders crossing these slopes on foot. Slopes on the left side of valley are higher in this area.

Valley Floor: to Bruenn, it averages 200-400 paces in width. Places which are more narrow: between Dalocin and Stepanov and in the Eichhorn-Bittischka area. Wider places: near Tischnowitz; near Eichhorn-Bittischka; below Komein (Komin), and west of Bruenn. Valley floor below Bruenn is 2-3 kilometers wide; below Seelowitz, 4-6 kilometers wide; below Branowitz, 2 kilometers wide; then it merges with the valley floor of the Thaya River.

Cover: in the narrow sections are meadows; otherwise also arable land. Downstream from Moedritz (Modrice) extensive, dense, often wet, grassy plains are alongside the river; they are difficult to cross on foot. From Nemcice on to the mouth of the river, these plains form a continuous strip,

RESTRICTED

1.5-2 kilometers in width.

Crossings: 33 foot and road bridges (BB 4257, Number 24, BB 4357, Numbers 19, 5, 92, 15); 9 railroad bridges (-).

Valley dam in Kinitz (BB 4357, Number 19).

Skalitz - Skalice

Left tributary of the Wottawa (Otava) - later forms the Lomnice (see above) - has a very deep stream bed. Along the Prague-Pisek road, the bank elevations are 40 meters high; can be crossed by vehicles only at bridges.

(Maehr.) Thaya - Dyje

Right tributary of the March (Morava); empties into the latter near the Austrian town of Hohenau. Here and there the river forms the border between the Reich and Czechoslovakia; flows through Austrian territory from Cerveny mylyn to Libunsky mlyn.

(Table on P. 70)

River bottom: rocky to Znaim; then coarse gravel; later mostly sandy.

1) at dams
2) at dams up to 1.5 meters
3) branch of an estuary, 30-50 meters

Obstructions: at normal water stage, the river is only a minor obstruction as far as Duernholz; this is, on the whole, significant for vehicles.

Banks: steep and rocky to above Znaim; then alternately boggy and flat. Downstream from the junction with the Igel River, crossing on foot is rendered more difficult by wooded plains with tall trees and marshy stretches of land.

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High Water Stage : 3-4 weeks in the spring. Downstream from Znaim, inundates the valley floor and causes it to become marshy in some places.

Ice Cover: will XXXXXXXXX support vehicles.

Breakup of Ice: usually in February.

Fords: almost throughout the course of the river.

Valley: above Znaim, it is deep, the sides rise steeply, and is often rocky. Densely wooded (generally oak trees).

Valley Floor: only in a few places is it 200-450 meters wide; is frequently confined to the river bed. Downstream from Znaim the valley floor increases in width from .8-5 kilometers.

Valley Elevations: flat; covered with arable land and vineyards. Downstream XXXX from the confluence with the Igel River, the elevations on the right side are higher.

Crossings: 37 foot and road bridges (in addition, 8 on the territory of the German Reich) (BB 4355, Number 3; BB 4455, Number 4); 6 railroad bridges (BB 4456, Number 2). Favorable crossing possibilities near Znaim, Eisgrub and Lundenburg.

Valley Dam (BB 4455, Number 4) from Frain (Vranov) upstream to Freistein (Frejstejn). Valley floor XXXX inundated; also the neighboring valleys in the vicinity of the river mouth are partially flooded. There is a large dam wall about 2 kilometers north of the town of Frain (Illustration 51); from Frain until XXXX where the river turns from XXX a west-east direction, there is a large artificial lake of varying widths. For more details on the operations of the Thaya valley dam, see index of notes under BB 4455, Number 4.

XXXXX Uslava

Right tributary of the Beraun (Berounka). Of little importance;

not a military obstruction. The confluence is north of Pilsen (Plzen).

Crossings EX (below Blowitz - Blovice): 14 road bridges (-); 2 railroad bridges (BB 4051, Number 7).

Wottawa - Otava

Left tributary of the Moldau(Vltava); empties into the latter near Zvikov. Along the upper course of the river near Bergreichenstein (Kasperske Hory), there is a narrow mountain valley. River is 20-30 meters wide, very shallow, stony, and is fordable. Farther downstream, the river fluctuates greatly in width and depth; near Kestrany, it is 25 meters wide and 1.2 meters deep. Between Strakonitz and Pisek there is a very wet meadow basin, 2 kilometers wide; otherwise the land is dry, on the whole, except when floods occur. River bed is stony, 60 meters wide near Pisek, and is fordable. Above and downstream from Pisek, there is a narrow trenchlike gorge, difficult to cross on foot, often rocky, without approaches or bridges. Near Zvikov the river is 40 meters wide and .8 meters deep. At high water stage (which seldom occurs), the river is a considerable obstruction.

Crossings: 25 foot and road bridges (BB 4351, Numbers 70, 69,77, 68, 67, 66; BB 4251, Numbers 106, 105, 104, 102, 101, 99; BB 4252, Numbers 98, 97, 96, 95, 94, 93, 92, 24); 3 railroad bridges (BB 4251, Number 103, BB 4252, Number 5).

Between Pisek and the mouth (25 kilometers), rafts can be floated on the Wottawa. The banks are regulated. Later on, it is intended to make this section of the river navigable.

Zohsee - Moravska Sazava

Right tributary of the March. Penetrates deeply near Landskron (Lanskroun); 5-6 meters wide; has many weirs and locks. Water volume varies greatly; usually not of importance as an obstruction. To Budigsdorf (Krasikov) there is a broad, wet meadow valley. The transverse valley to Hohenstadt (Zabreh) is narrow and generally has little water. Near the junction with the March, there are many flooded meadows.

Zwittau - Svitava

Left tributary of the Schwarzawa (Svratka); empties into the latter south of Bruenn.

Obstruction: the river is an obstruction because of its depth only between Dubrawitz (Doubravice nad Svitavou) and Blansko. From Blansko to Obrzan it is an obstruction because of the valley slopes which cannot be crossed on foot. It is regulated in places, particularly in the outskirts of Bruenn (from Obrzan) where the quays are 5-8 meters high and the river bed is usually 30 meters wide.

Width: 2-6 meters wide to Dubrawitz; 8 meters wide to Blansko; 12-20 meters wide to Bruenn.

Depth: .1-.3 meters deep to Dubrawitz; 1-3 meters deep between Dubrawitz and Blansko; .5-1 meter deep from Blansko to Bruenn.

River Bottom: to Dubrawitz, it is alternately muddy and gravelly; to Blansko, it is muddy, then gravelly; in the gap between Blansko and Obrzan, it is rocky in places.

Velocity: .1-.2 meters; in some places, especially between Blansko and Obrzan, up to 1 meter.

High Water Stage: when the snow melts and also during the summer months. Subsides in a few days.

Ice Cover: thick.

Valley Elevations: mountainous and hilly. Between Blansko and Obrzan, the elevations resemble gorges.

Valley Slopes: on the whole, are rather steep; for the most part are wooded and not easy to cross on foot. Only the broad parts of the valley are moderately sloping, cultivated, and easy to cross on foot. Between Blansko and Obrzan

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the valley slopes are very steep, frequently rocky, wooded down to the river and cannot be crossed on foot.

Valley Floor: 30-150 meters wide to Svitavka; from Svitavka to Blansko, broad sections of the valley floor, .5- 1 kilometer wide, alternate with narrow sections, 150-200 meters wide. Between Blansko and Obrzan, the valley floor is only wide enough for the river and the newly constructed Bilowitz-Adamsthal road (Bilovice nad Svitavou-Adamov). Near Bruenn the valley floor joins that of the Schwarzawa. The valley floor is covered almost throughout with meadows; there is arable land only on the higher parts of the valley plains.

Crossings: (from Zwittau-Svitavy): 30 foot and road bridges (BB 4257, Number 39); BB 4357, Number 98); 17 railroad bridges (-).

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